

CLAIMS

- 1 1. An apparatus comprising:
2 at least one processor;
3 a memory coupled to the at least one processor; and
4 an optimizer residing in the memory and executed by the at least one processor,
5 the optimizer analyzing an expression and generating from the expression a graph that
6 includes at least one node, the optimizer generating from the graph an execution plan for
7 the expression, the execution plan comprising a plurality of execution plans that
8 correspond to different portions of the graph.
- 1 2. The apparatus of claim 1 wherein the plurality of execution plans are appended to
2 corresponding nodes in the graph.
- 1 3. The apparatus of claim 1 wherein the optimizer generates a new execution plan
2 for the query by changing at least one of the plurality of execution plans, and by using an
3 existing execution plan for each portion of the graph that is unaffected by the change.
- 1 4. The apparatus of claim 1 wherein the graph further comprises a plurality of
2 relations and a plurality of expressions.

1 5. An apparatus comprising:
2 at least one processor;
3 a memory coupled to the at least one processor;
4 a database residing in the memory;
5 a database query optimizer residing in the memory and executed by the at least
6 one processor, the database query optimizer processing a query to the database, the
7 database query optimizer comprising:
8 a graph builder that generates from the query a graph that includes at least
9 one node; and
10 an execution plan generator that generates from the graph an execution
11 plan for the query, the execution plan comprising a plurality of execution plans
12 that correspond to different portions of the graph.

1 6. The apparatus of claim 5 wherein the execution plan generator appends the
2 plurality of execution plans to corresponding nodes in the graph.

1 7. The apparatus of claim 5 wherein the execution plan generator generates a new
2 execution plan for the query by changing at least one of the plurality of execution plans,
3 and by using an existing execution plan for each portion of the graph that is unaffected by
4 the change.

1 8. The apparatus of claim 5 wherein the graph further comprises a plurality of
2 relations and a plurality of expressions in the query.

1 9. The apparatus of claim 5 wherein the optimizer compares a plurality of execution
2 plans that each functionally represent the query to estimate which of the plurality of
3 execution plans will be executed in the least amount of time.

1 10. A method for evaluating an expression comprising the steps of:
2 reading the expression;
3 generating from the expression a graph that includes at least one node;
4 generating from the graph an execution plan for the expression, the execution plan
5 comprising a plurality of execution plans that correspond to different portions of the
6 graph.

1 11. The method of claim 10 further comprising the step of appending the plurality of
2 execution plans to corresponding nodes in the graph.

1 12. The method of claim 10 further comprising the step of generating a new execution
2 plan for the query by performing the steps of:
3 changing at least one of the plurality of execution plans; and
4 using an existing execution plan for each portion of the graph that is unaffected by
5 the change.

1 13. The method of claim 10 further comprising the step of comparing a plurality of
2 execution plans that each functionally represent the query to determine which of the
3 plurality of execution plans will likely be executed in the least amount of time.

1 14. A program product comprising:

2 (A) an optimizer that analyzes an expression and generates from the expression a
3 graph that includes at least one node, the optimizer generating from the graph an
4 execution plan for the expression, the execution plan comprising a plurality of execution
5 plans that correspond to different portions of the graph; and

6 (B) computer-readable signal bearing media bearing the optimizer.

1 15. The program product of claim 14 wherein the computer-readable signal bearing
2 media comprises recordable media.

1 16. The program product of claim 14 wherein the computer-readable signal bearing
2 media comprises transmission media.

1 17. The program product of claim 14 wherein the optimizer appends the plurality of
2 execution plans to corresponding nodes in the graph.

1 18. The program product of claim 14 wherein the optimizer generates a new
2 execution plan for the query by changing at least one of the plurality of execution plans,
3 and by using an existing execution plan for each portion of the graph that is unaffected by
4 the change.

1 19. The program product of claim 14 wherein the graph further comprises a plurality
2 of relations and a plurality of expressions.

1 20. The program product of claim 14 wherein the optimizer compares a plurality of
2 execution plans that each functionally represent the expression to estimate which of the
3 plurality of execution plans will be executed in the least amount of time.

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